MICRO-COAX®

STANDARD AND SPECIAL SEMI-RIGID COAXIAL CABLES

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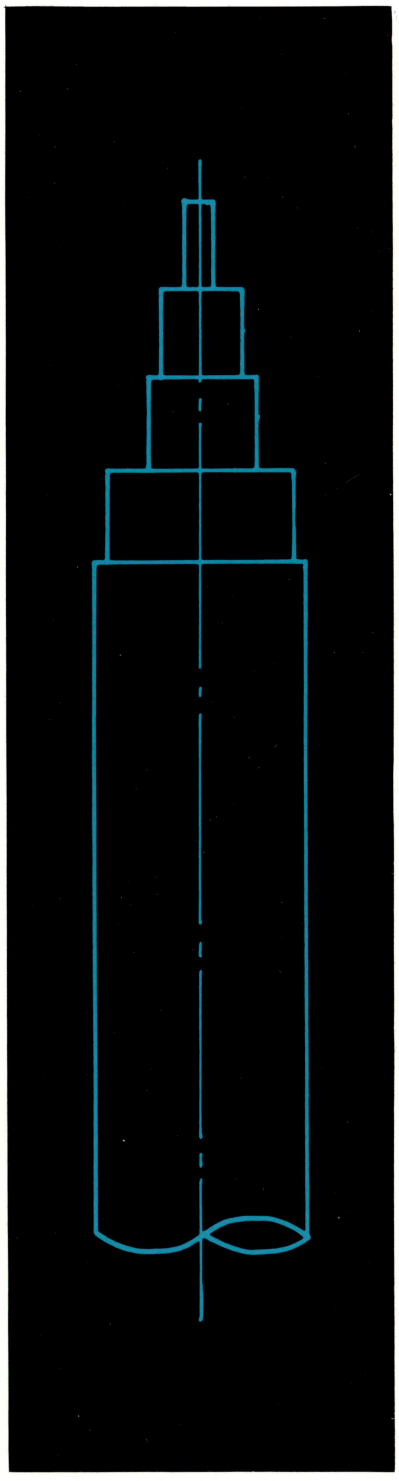

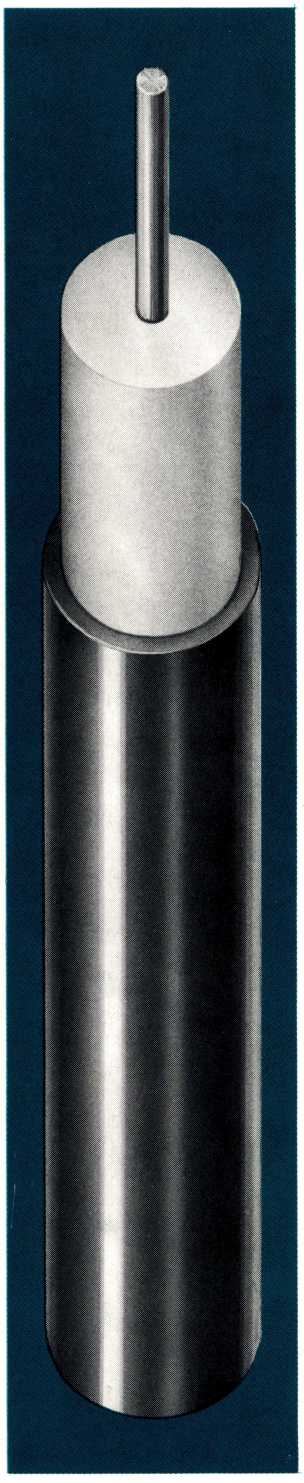

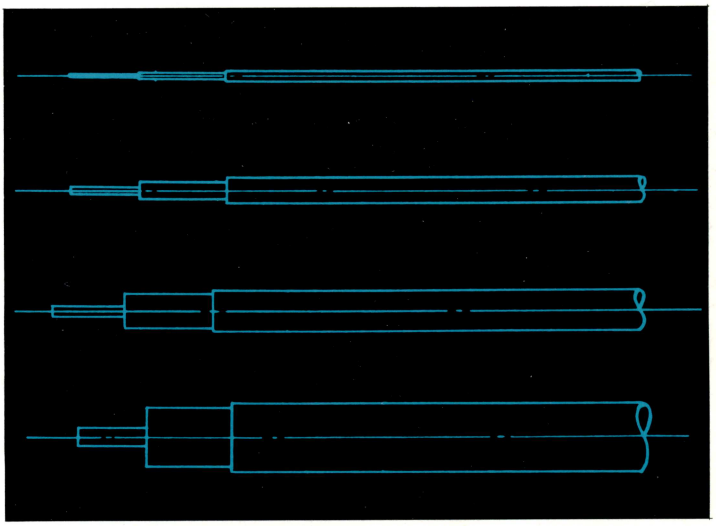

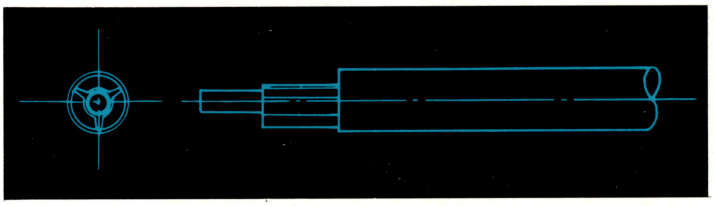

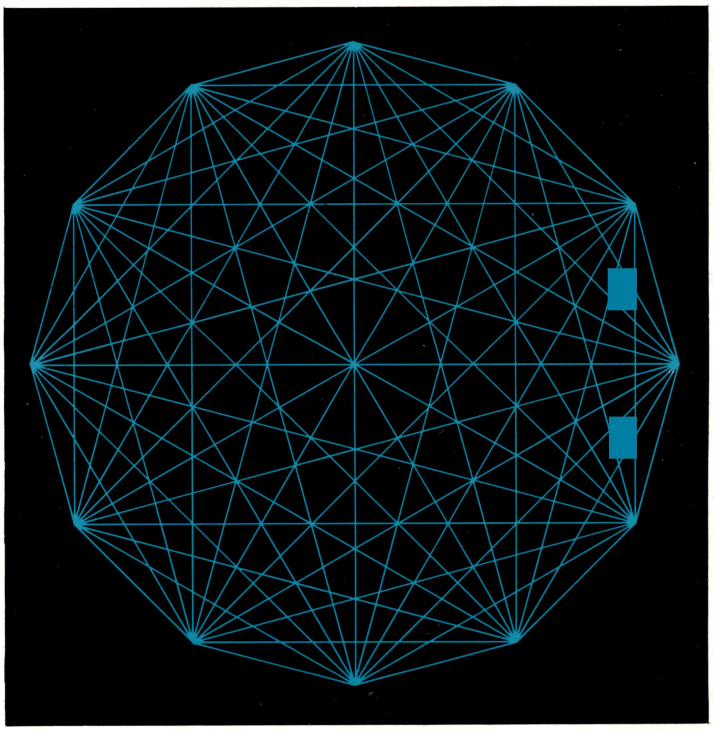

Bulletin 317C
Information for Ordering

MicroDelay Division

UNIFORM TUBES, INC. Collegeville, Pa. 19426
. . . a UTI company

DATA FOR ORDERING

In this catalog, standard and special Micro-Coax Semi-Rigid Cables are grouped by characteristic impedance.

Within the impedance limits indicated by the system, values are shown in several frequency ranges for all of the factors to be considered in the selection of the optimum cable – attenuation, size, weight, power handling ability, connector interface.

For more specific effects on attenuation, power handling, etc., as a function of VSWR, altitude, and temperature, see the graphs and pertinent equations in the Micro-Coax Design Guide.

MIL-C-17E Qualified Products

Micro-Coax Cable has been qualified under MIL-C-17E Qualified Products List (QPL) 17.

Government Designation	Uniform Tube Designation	Supersedes
M17/129-RG401	UT-250A-M17	RG 401/U
M17/129-00001	UT-250A-TP-M17	–
M17/130-RG402	UT-1415A-M17	RG 402/U
M17/130-00001	UT-1415A-TP-M17	–
M17/133-RG405	UT-85-M17	RG 405/U
M17/133-00001	UT-85-TP-M17	–
M17/133-00002	UT-85C-M17	–
M17/133-00003	UT-85C-TP-M17	–
M17/151-00001	UT-47-M17	–
M17/151-00002	UT-47-TP-M17	–
M17/154-00001	UT-34-M17	–
M17/154-00002	UT-34-TP-M17	–

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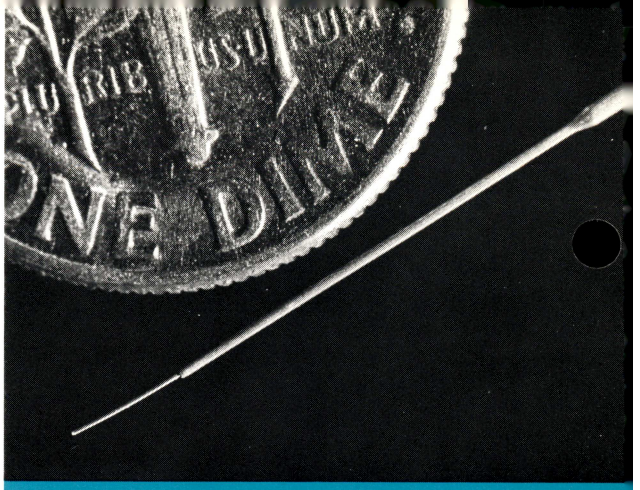
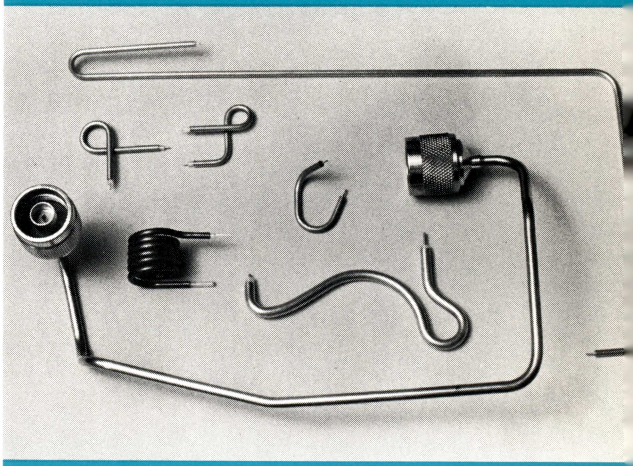
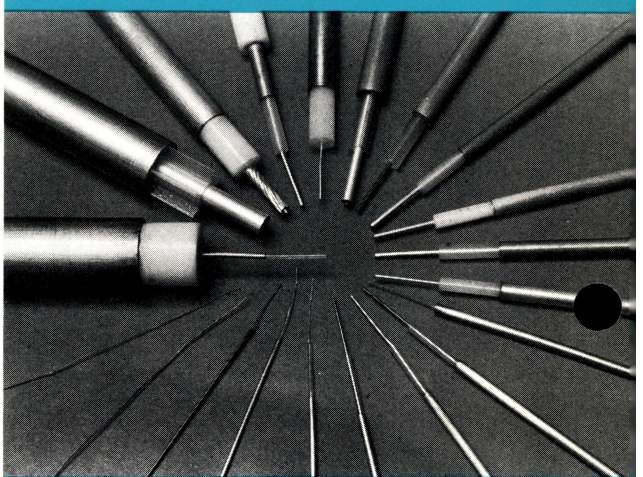


COAXIAL TRANSITION



CABLE ASSEMBLIES

COAXIAL DELAY LINES



PRODUCTION SIZES OF SEMI-RIGID COAXIAL CABLE

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Exposure of PTFE Insulated Cables to Elevated Temperatures

Exposure of cables with PTFE insulation to elevated temperatures causes stressing of the outer conductor, since the thermal expansion coefficient of the core insulation is about ten times greater than that of the metal conductors. The effects of this outer conductor stressing require distinction of two temperature levels as cables are subjected to increasing temperatures.

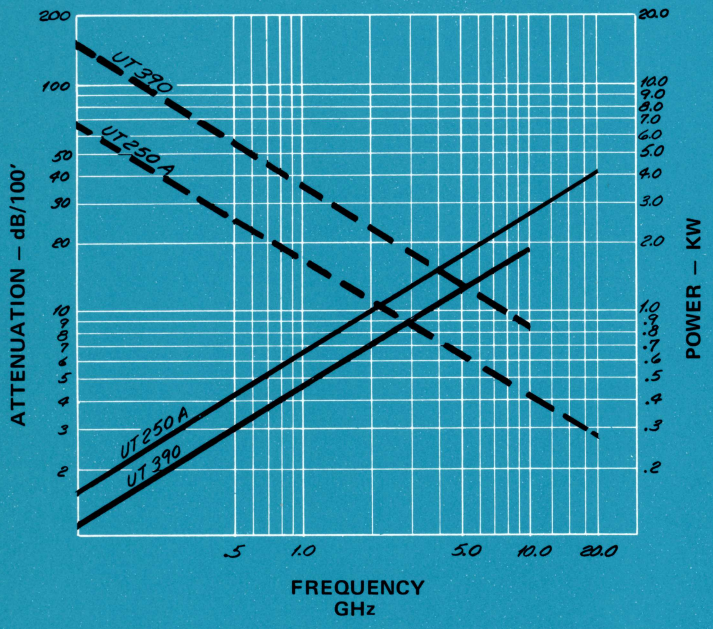
(T_o): RECOMMENDED MAXIMUM OPERATING TEMPERATURE

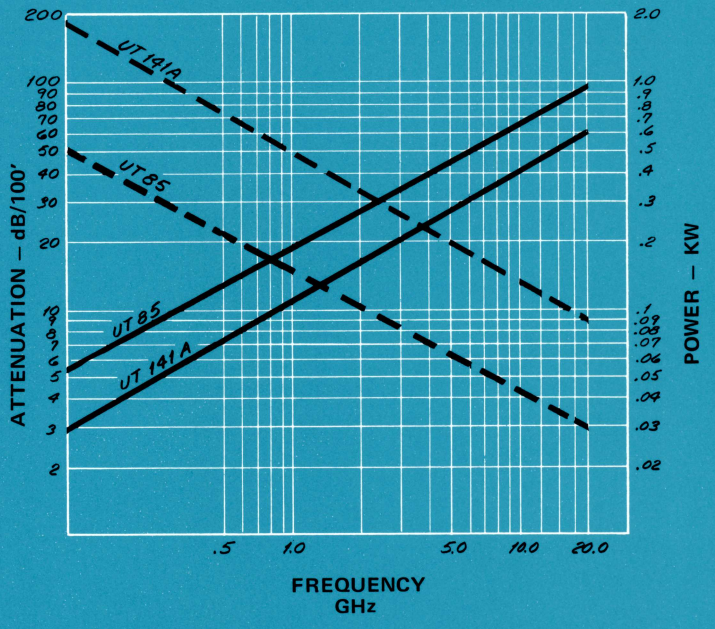
The first significant effect on cable characteristics occurs as the expansive forces of the core material exceed the yield strength of the outer conductor material, so that a permanent increase in the cable outer diameter results. The outer conductor OD increase is accompanied by a permanent increase in impedance, and permanent decrease in capacitance, core adhesion, and corona extinction potential. The temperature at which such changes begin is denoted in this Bulletin as T_o, the maximum recommended operating temperature, which has been determined by testing 1 ft. long specimens until a discernible increase in outer conductor OD was measured on 30% of the number of test specimens.

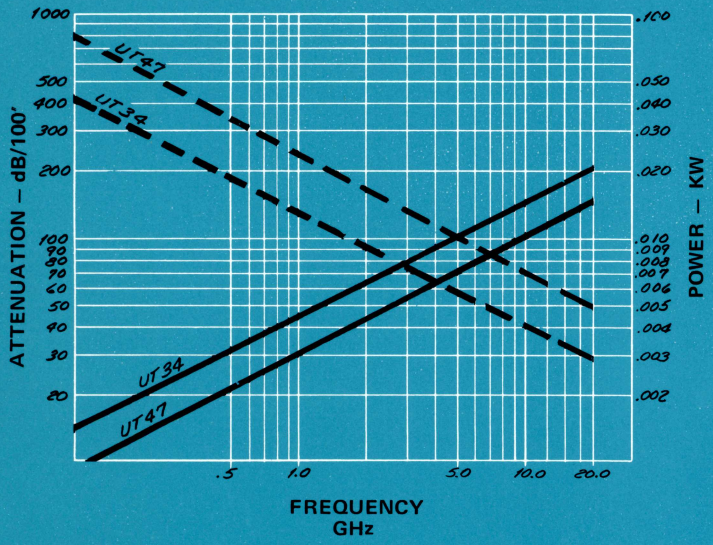
(T_t): OUTER CONDUCTOR INTEGRITY TEST TEMPERATURE

The second significant effect of temperature exposure is to cause catastrophic failure of the outer conductor as the core stresses exceed the tensile strength of the outer conductor material. This temperature is denoted in this Bulletin as T_t, the outer conductor integrity test temperature, which has been determined by testing 2 ft. long specimens, with no failures being allowed at the rated temperature. (For test details, refer to MIL-C-17E).

Attenuation and Average Power Rating For Standard 50 Ohm Micro-Coax Cables







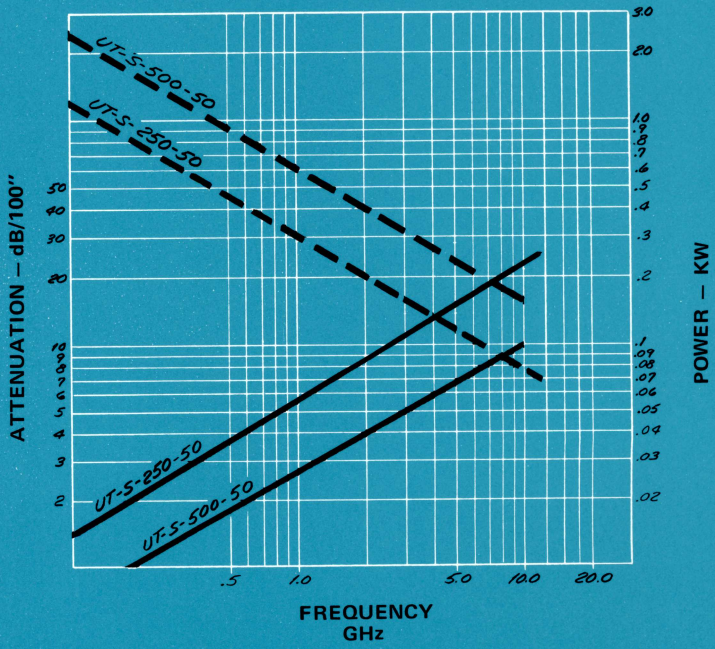


TABLE 1

Standard General Purpose 50 Ohm Micro-Coax Cables

Standard 50 Ohm Micro-Coax cables feature low VSWR and low attenuation covering the entire microwave spectrum. They have good power handling ability and excellent interface dimensions for SMA, SMB, Type N and TNC connectors.

Cable Properties:

Copper outer conductors
Teflon® PTFE dielectrics
Wide variety of outer conductor diameters
Capacitance 29.0 pF/ft
Velocity of propagation 70%

Typical applications:

Microwave transmission lines
Amplifier shielding or isolation
Totally sheilded interconnections
Microwave delay lines

TABLE 2

Standard 50 Ohm Micro-Coax Cables

Supplied in lengths for use in coaxial delay lines or other applications which require continuous lengths. Lengths available from stock are UT-85 Type 25 to 100 ft.; UT-141A Type 25 to 150 ft.; UT-250A Type 25 to 150 ft.

TABLE 3

Ultra Miniature 50 Ohm Micro-Coax Cables

Ultra-miniature 50 Ohm Micro-Coax cables give maximum impact of signal clarity. They meet the demands of package density, optimum VSWR and attenuation as a function of size. They feature total shielding for the elimination of signal loss and noise, and are ideal for low power, high reliability applications.

Cable properties:

Copper outer conductor
Teflon® PTFE & FEP dielectrics
Capacitance of 29.0 pF/ft
Ultra miniature sizes
Velocity of propagation 70%

Typical applications:

High reliability miniature packages
Miniature delay lines
Printed circuit wiring
High speed computers

TABLE 4

50 Ohm Micro-Coax Cables with Special Outer Conductors

Aluminum or stainless steel outer conductor materials in 50 Ohm Micro-Coax Cables optimize such properties as resistance to corrosion, the ability to withstand temperature extremes and weight.

Cable properties and features:

Solid Teflon® PTFE or FEP dielectrics
Capacitance 29.0 pF/ft
Velocity of propagation 70%
Resistance of corrosion
Resistance to temperature extremes
Resistance to short term nuclear bombardment
Light weight

Typical applications:

Any temperature or weight restricted environment circuitry from undersea to outer space conditions

TABLE 1

Micro-Coax Part Number	Normal Impedance and Tolerance (ohms)	Outer(1) Conductor Diameter ±.001"	Dielectric Diameter ±.001"	Center Conductor Diameter (inches) Nominal	Center Conductor Material
UT- 85	50.0±1.5	.0865*•	.066	.0201	SPCW
UT- 85C	50.0±1.5	.0865*•	.066	.0201	SPC
UT-141	49.0±1.0	.141 •	.116	.0359	SPCW
UT-141A	50.0±1.0	.141 *•	.1175	.0359	SPCW
UT-141AA	50.0±0.5	.141 *•	.1175	.0359	SPCW
UT-141SA**	50.0±1.0	.141	.1175	.0359	SPCW
UT-141B	50.0±1.0	.141 •	.1175	.0359	SP BeCu
UT-141C	50.0±1.0	.141 *•	.1175	.0359	SPC
UT-141L	50.0±1.0	.141	.1175	.0359	Tophet C†
UT-250A	50.0±0.5	.250 *	.209(2)	.0640	SPC
UT-325A	50.0±1.0	.325(2)	.285(2)	7x .0312	SPC
UT-390	50.0±0.5	.390(2)	.332(2)	.102	SPC

† Trademark W.B. Driver Co.
** Dimensional stability per MIL-C-17E, paragraph 4.8.21.2, within 0.005" max., dielectric recession in 6" text specimen.

TABLE 2

UT- 85 Type	50±3.0	.0865(2)	.066(2)	.0201	SPCW
UT-141A Type	50±2.0	.141(3)	.1175(3)	.0359	SPCW
UT-250A Type	50±2.0	.250(3)	.209(3)	.064	SPCW

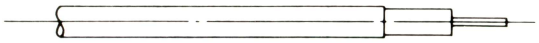
TABLE 3

UT- 8	50.0±5.0	.008	.0045	.002	C
UT-13	50.0±4.0	.013	.010	.0031	SPCW
UT-20	50.0±3.0	.023	.0165	.005	SPCW
UT-34	50.0±3.0	.034 *•	.026	.008	SPCW
UT-47	50.0±2.5	.047 *•	.037	.0113	SPCW
UT-70-50 (Old No. UT-701)	50.0±2.0	.070	.059	.0179	SPC

TABLE 4

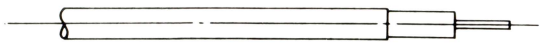
UT- 20SS	50.0±3.0	.020	.015	.0045	SPCW
UT- 85SS	50.0±1.5	.0865	.066	.0201	SPCW
UT-141SS	50.0±1.0	.141	.1175	.0359	SPCW
UT-141 A-AL (1100)	50.0±1.5	.141	.1175	.0359	SPCW
UT-141 A-AL (5052)	50.0±1.0	.141	.1175	.0359	SPCW
UT-250 A-AL (1100)	50.0±1.0	.250	.209(2)	.064	SPC
UT-250 A-AL (5052)	50.0±0.5	.250	.209(2)	.064	SPC
UT-325 A-AL (1100)	50.0±1.5	.325(2)	.285(2)	7x .0312	SPC

(1) For plated conductor allow additional +.001".
(2) Dimensional tolerance ±.002".
(3) Dimensional tolerance ±.003".
(4) Nominal Dielectric Diameter.
(5) T_t/T_o defined on page 3.



UT-141A — **Standard General Purpose 50 Ohm Micro-Coax Cables**

Minimum Inside Bend Radius (inches)	T_t/T_o[5] (°C)	Weight (lbs./100')	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW) at 25°C and Sea Level				
						0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
.125	150/100	1.4	2500	1500	60	13.0/0.221	19.0/0.151	44.0/0.065	64.5/0.045	96.0/0.030
.125	150/100	1.4	2500	1500	60	13.0/0.221	19.0/0.151	44.0/0.065	64.5/0.045	96.0/0.030
.250	175/100	3.2	5000	1900	34	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.250	175/100	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.250	175/100	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.250	175/125	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.250	175/100	3.2	5000	1900	33	8.5/0.742	12.0/0.506	28.0/0.214	41.0/0.140	62.0/0.091
.250	175/100	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.250	175/100	3.2	5000	1900	33	45.0/0.742	57.5/0.506	130.0/0.214	187.0/0.140	268.0/0.091
.375	150/90	10.0	7000	3000	19	4.3/2.622	6.4/1.762	16.5/0.683	26.0/0.434	41.0/0.275
.750	150/90	14.5	7500	3000	14	3.0/4.733	5.0/2.840	13.0/1.092	20.5/0.693	
.750	150/90	25.0	12000	6000	12	3.0/5.512	4.5/3.675	12.0/1.378	19.0/0.870	

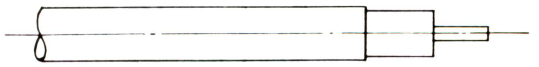


UT-141A Type — **Standard 50 Ohm Micro-Coax Cables**

.125	150/100	1.4	2500	1500	60	13.0/0.221	19.0/0.151	44.0/0.065	64.5/0.045	96.0/0.030
.250	150/100	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
.375	150/90	10.0	7000	3000	19	4.3/2.622	6.4/1.762	16.5/0.683	26.0/0.434	41.0/0.275

UT-34 — **Ultra Miniature 50 Ohm Micro-Coax Cables**

.032	100/85	.10	250	150		141.0/	200.0/	448.0/		
.063	100/85	.10	250	150		63.0/	89.5/	202.0/	288.0/	413.0/
.063	100/85	.10	750	500	240	51.0/0.005	72.0/0.004	163.0/0.002	233.0/0.001	334.0/
.125	125/100	.19	2000	750	150	32.0/0.019	45.5/0.013	104.0/0.006	149.0/0.004	215.0/0.003
.125	125/100	.38	2000	1000	109	22.0/0.035	31.0/0.015	71.5/0.011	103.0/0.007	151.0/0.005
.125	150/145	.79	2300	1200	68	14.5/0.163	21.0/0.113	49.0/0.048	71.0/0.033	105.0/0.022



UT-250 AL — **50 Ohm Micro-Coax Cables with Special Outer Conductors**

.125	175/150	.10	750	500	240	118.0/0.007	167.0/0.006	376.0/0.003	534.0/0.001	761.0/
.250	225/200	1.3	2500	1500	60	29.8/0.227	42.4/0.115	97.2/0.067	140.0/0.046	203.0/0.031
.500	250/240	3.1	5000	1900	33	16.9/0.913	24.1/0.622	56.5/0.263	82.4/0.172	122.0/0.112
.250	150/85	1.9	5000	1900	33	8.0/0.527	11.5/0.359	28.0/0.152	41.5/0.099	64.0/0.064
.250	175/110	1.9	5000	1900	33	8.5/0.647	12.5/0.441	30.0/0.187	45.5/0.122	68.0/0.079
.375	175/80	6.4	7000	3000	19	4.5/1.900	6.8/0.127	17.5/0.496	27.0/0.315	43.0/0.199
.375	200/90	6.4	7000	3000	19	5.0/2.26	7.0/1.52	18.5/0.591	28.5/0.375	45.0/0.237
.750	175/80	10.5	7500	3000	14	4.3/3.82	6.3/2.57	16.5/0.965	27.0/0.610	

*: Tin-plated (TP)
•: Silver-plated (SP)
SPC: Silver-plated copper.
SPCW: Silver-plated, copper-clad steel.

SPBeCu: Silver-plated beryllium copper.
SS: Type 304 Stainless steel.
SPCT: Silver-plated copper tube.
AL: Aluminum

TABLE 5

Ultra Malleable 50 Ohm Micro-Coax Cables

50 Ohm ultra malleable cables provide a unique solution to packaging and performance requirements at a slight sacrifice in VSWR and impedance matching. These cables possess 3–5 times as much power handling ability as standard Micro-Coax cables. They can be soldered to any ground plain at any point without fear of outer conductor failure and they can be bent to fit practically any package requirement.

Cable properties and typical applications

The properties and applications are identical to those of ultra miniature cable (Table 3) where sacrifices can be made to attain a higher power rating and ease of soldering and bending.

TABLE 5

Micro-Coax Part Number	Normal Impedance and Tolerance (ohms)	Outer(1) Conductor Diameter ±.001"	Dielectric Diameter ±.001"	Center Conductor Diameter (inches) Nominal	Center Conductor Material
UT-20M	50.0±8.0	.023	.013(4)	.0045	SPCW
UT-34M	50.0±6.0	.0375	.024(4)	.008	SPCW
UT-47M	50.0±4.0	.050	.037(4)	.0113	SPCW

TABLE 6

10, 15, 25, 70, 75, 93 and 95 Ohm Micro-Coax Cables

Copper jacketed cables designed to meet close tolerances in both impedance and capacitance. Sizes range from .034" through .250". Total shielding eliminates undersized coupling while copper jacket facilitates direct soldering.

Cable properties:

Copper outer conductors
Teflon® PTFE dielectric
Velocity of propagation 70%
Total shielding

Typical applications:

CATV amplifier wiring
Capacitor sections
Low impedance matching for solid state units
Quarter wave transformer sections

TABLE 6

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ±.001"(1)	Dielectric Diameter ±.001"	Center Conductor Diameter (inches) Nominal	Center Conductor Material
UT- 34-25 (Old No. UT- 25)	25±3.0	.034	.023	.0126	SPCW
UT- 34-95	95±4.0	.034	.027	.0028	SPCW
UT- 47-70	70±3.0	.047	.0375	.0071	SPCW
UT- 43-10 (Old No. UT-10)	10±3.0	.043	.036	.0285	C
UT- 90-25	25±3.0	.090	.073	.040	SPC
UT- 85-70 (Old No. UT-70)	70±2.0	.085 •	.060	.0113	SPCW
UT- 85-75 (Old No. UT-852)	75±2.0	.085	.067	.0113	SPCW
UT- 85-93 (Old No. UT-851)	93±1.5	.085	.073	.008	SPCW
UT-130-93 (Old No. UT- 93)	93±1.5	.130	.104	.0113	SPCW
UT-141-15	15±3.0	.141	.114	.080	SPC
UT-141-70	70±1.0	.141	.107	.0201	SPCW
UT-141-70C	70±1.0	.141	.107	.0201	SPC
UT-141-75	75±1.0	.141 *	.1175	.0201	SPCW
UT-141-75C	75±1.0	.141	.1175	.0201	SPC
UT-250-75	75±1.0	.250(2)	.210(2)	.0359	SPCW

TABLE 7

Air Articulated (Spline) 50 Ohm Cables

Air articulated cables provide excellent impedance matching, low weight, low loss transmission lines. Although special care must be taken in bending and installation of these cables, they provide properties not found in solid dielectric cables.

Cable properties:

Low attenuation
Low weight
Copper or aluminum outer conductors
Tubular copper center conductors
Teflon® PTFE spline dielectrics

Typical applications:

Spacecraft interconnections
Antenna feed cables
Liquid level sensing devices
Low loss receivers

TABLE 7

Micro-Coax Part Number	Outer Conductor Diameter ±.002"	Dielectric Diameter ±.002"	Number of TFE Splines	Center Conductor SPCT Outside Diameter ±.001"	Center Conductor Inside Diameter ±.002"
OFHC Copper					
UT-S-250-50	.250	.221	3	.087	.066
UT-S-325-50	.325	.285	5	.110	.090
UT-S-375-50	.375	.325	5	.126	.085
UT-S-390-50	.390	.340	5	.136	.096
UT-S-500-50	.500	.450	5	.174	.134
1100 Aluminum					
UT-S-250-50 AL	.250	.221	3	.087	.066
UT-S-325-50 AL	.325	.285	5	.110	.090
UT-S-390-50 AL	.390	.340	5	.136	.096
UT-S-500-50 AL	.500	.450	5	.174	.134

(1) For plated conductor allow additional +.001".
(2) Dimensional tolerance ±.002".
(3) Dimensional tolerance ±.003".
(4) Nominal Dielectric Diameter.
(5) T_t/T_o defined on page 3.

*: Tin-plated (TP)
•: Silver-plated (SP)
SPC: Silver-plated copper.
SPCW: Silver-plated, copper-clad steel.

SP BeCu: Silver-plated beryllium copper.
SS: Type 304 Stainless steel.
SPCT: Silver-plated copper tube.
AL: Aluminum.

UT-34M

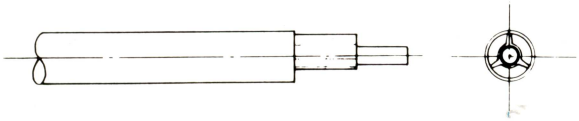
Ultra Malleable 50 Ohm Micro-Coax Cables

Minimum Inside Bend Radius (inches)	T_t/T_o (5) (°C)	Weight (lbs./100')	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW) at 25°C and Sea Level				
						0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
.032	200/175	.10	750	500		51.0/0.019	72.0/0.013	163.0/0.006	233.0/0.004	334.0/
.063	225/200	.27	2000	750	150	32.0/0.072	45.5/0.050	104.0/0.022	149.0/0.015	215.0/0.010
.063	250/230	.45	2000	1000	109	22.0/0.132	31.0/0.096	71.5/0.042	103.0/0.029	151.0/0.020

UT-85-75

10, 15, 25, 70, 93 and 95 Ohm Micro-Coax Cables

Minimum Inside Bend Radius (inches)	T_t/T_o (5) (°C)	Capacitance (pF/ft)	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW) at 25°C and Sea Level				
						0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
.125	125/100	58.5	500	200	143.7	47.5/0.013	67.5/0.009	153.0/0.004	218.5/0.003	313.5/0.001
.125	125/100	15.4	2000	1000	17.5	40.5/0.013	57.5/0.009	131.0/0.004	188.0/0.003	270.0/0.001
.125	100/85	20.6	2000	1000	11.8	23.5/0.031	33.5/0.022	77.5/0.010	112.0/0.006	163.0/0.004
.250	125/100	145.0	500	200	81.0	61.5/0.013	87.0/0.009	179.5/0.004	281.5/0.003	402.5/0.001
.125	175/100	58.5	1000	750	46.0	15.5/0.182	22.0/0.130	51.5/0.056	75.0/0.038	111.0/0.026
.125	175/150	20.6	2000	1200	78.0	15.0/0.190	22.0/0.130	50.5/0.057	74.0/0.039	109.5/0.026
.125	125/100	19.3	2500	1200	67.0	14.0/0.205	20.0/0.143	46.5/0.062	68.0/0.042	100.5/0.028
.125	150/140	15.6	2500	1200	65.0	15.0/0.190	21.5/0.133	50.0/0.057	73.0/0.039	107.5/0.027
.250	175/100	15.6	3000	1500	45.0	10.5/0.488	15.0/0.341	36.5/0.140	53.5/0.095	80.5/0.063
.250	175/150	97.0	1000	750	27.0	9.0/0.618	13.0/0.428	32.0/0.173	47.5/0.117	71.5/0.077
.250	175/90	20.6	5000	2000	41.0	8.5/0.655	12.5/0.445	30.0/0.185	44.5/0.125	67.5/0.082
.250	175/90	20.6	5000	2000	41.0	8.5/0.655	12.5/0.445	30.0/0.185	44.5/0.125	67.5/0.082
.250	175/90	19.3	5000	2000	38.0	8.0/0.696	11.5/0.484	28.0/0.198	41.5/0.133	63.5/0.087
.250	175/90	19.3	5000	2000	38.0	8.0/0.696	11.5/0.484	28.0/0.198	41.5/0.133	63.5/0.087
.500	200/90	19.3	7000	3000	21.0	4.5/2.505	6.5/1.735	175.0/0.644	27.0/0.418	42.5/0.265



UT-S-250-50

Air Articulated (Spline) 50 Ohm Cables

Minimum Inside Bend Radius (inches)	T_t/T_o (5) (°C)	Weight (lbs./100')	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW) at 25°C and Sea Level				
						0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	12.0 GHz
3.0	200/150	5.6	4000	1400	21.0	3.7/0.46	5.4/0.32	13.8/0.12	21.5/0.08	25.0/0.07
5.0	200/150	9.5	5000	2000	16.4	2.8/0.61	4.2/0.41	11.0/0.15	16.5/0.10	19.0/0.09
5.0	200/150	15.0	5000	2200	14.4	2.5/0.68	3.7/0.46	9.2/0.19	14.3/0.12	17.0/0.10
5.0	200/150	16.3	5000	2200	13.6	2.3/0.74	3.4/0.50	8.0/0.21	12.0/0.14	15.0/0.11
6.0	200/150	21.0	7500	3000	10.4	1.8/0.94	2.7/0.63	6.0/0.28	10.0/0.16	
3.0	200/125	2.6	4000	1400	21.0	4.2/0.37	6.5/0.26	17.5/0.09	24.3/0.06	27.5/0.05
5.0	200/125	4.5	5000	2000	16.4	3.4/0.49	5.0/0.33	13.2/0.12	20.8/0.08	23.6/0.07
5.0	200/125	7.5	5000	2200	13.6	2.8/0.60	4.2/0.40	11.4/0.15	18.3/0.11	21.0/0.08
6.0	200/125	11.0	7500	3000	10.4	2.3/0.76	3.4/0.51	9.7/0.22	15.9/0.13	

TABLE 8

High Temperature Micro-Coax Cables

High temperature Micro-Coax cables primarily utilize dielectrics of alumina or magnesia to withstand temperatures exceeding 250°C or nuclear particle flux. The temperature limitation of the resultant cable then becomes the softening point of the lowest melting point conductor.

Since these dielectrics are in powdered form, they require hermetically sealed connectors.

Cable properties:

Wide selection of outer conductor materials
M_gO or Al_2O_3 dielectrics
Varied selection of center conductor materials

Typical applications:

Any high temperature application
Cables to support and transmit in nuclear environment

TABLE 9

Cryogenic Feed and High Pressure 50 Ohm Cables

These cables are available on special order, and are custom designed to meet heat transfer rates within allowable loss parameters.

Cables can be offered with tubular center conductors to minimize the cross-sectional area of the conductor with no loss of performance in the microwave signal spectrum. Careful connector selection is mandatory.

Cable properties:

Tubular outer conductors
Vacuum seals have been achieved with solid conductor cables
Solid Teflon® PTFE dielectrics
Wide selection of electrical conductivity
Wide selection of thermal conductivity

Typical applications:

Dewar input lines
Pump signal feeds
High pressure installations
Corrosive environments

TABLE 10

Superconductive 50 Ohm Micro-Coax Cables

Delay lines and transmission lines operating in cryogenic environments can be manufactured to superconduct. Normally, a Niobium center conductor is used for strength, lead or Niobium for outer conductors, and a Teflon® PTFE dielectric.

TABLE 11

Triaxial Cables

Triaxial cables (cable within a cable) are an efficient means of carrying 2 distinct signals in one cable. Both inner and outer cables can be closely controlled for impedance and capacitance. Nearly any geometry can be manufactured. If the combination of inner and outer cable is of unequal impedance, it is recommended that the inner cable be the high impedance cable if the wire size is adequate. Equal impedance cables are available as well. Available on special order. Data on request.

Cable properties:

Choice of conductors
One or more dielectric including inner solid, outer spline
Combination of impedances

Typical applications:

Special purpose

TABLE 8

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ± .001"	Dielectric Diameter ± .001"	Center Conductor Diameter (inches) Nominal	Outer Conductor Material
UT- 85 I	50.0±4.0	.085(2)	.065(2)	.009	Cu
UT-141 I	50.0±3.0	.141(2)	.118(2)	.018	Cu
UT-160-C SS-I	50.0±3.0	.160(2)	.118(2)	.018	SS over Cu
UT-250 I	50.0±3.0	.250(2)	.215(2)	.033	Cu
UT-250 I-SS	50.0±3.0	.250(2)	.215(2)	.033	SS

TABLE 9

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ± .001"	Dielectric Diameter ± .001"	Center Conductor Diameter Outside (inches) Nominal
UT-20-50-SS-SS	50.0±3.0	.020	.015	.0045
UT-85-50-B-B	50.0±1.5	.0865	.066	.0201
UT-T-85-50-B-B	50.0±1.5	.0865	.066	.0201
UT-T-85-50-SS-B	50.0±1.5	.0865	.066	.0201
UT-141-50-SS-B	50.0±1.0	.141	.1175	.0359
UT-141-50-SS-SS	50.0±1.0	.141	.1175	.0359
UT-T-141-50-SS-B	50.0±1.0	.141	.1175	.0359
UT-250-50-B-B	50.0±0.5	.250(2)	.209(2)	.064
UT-250-SS	50.0±0.5	.250(2)	.209(2)	.064
UT-S-250-50-SS-SS	50.0±1.0	.250(2)	.221(2)	.087

TABLE 10

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ± .001"	Dielectric Diameter ± .001"	Center Conductor Diameter Outside (inches) Nominal
UT-85-50-Pb-Nb	50.0±2.0	.0865	.066	.0201
UT-85-50-Nb-Nb	50.0±1.5	.0865	.066	.0201
UT-141-50-Pb-Nb	50.0±1.5	.141	.1175	.0359
UT-141-50-Nb-Nb	50.0±1.0	.141	.1175	.0359

TABLE 11

Micro-Coax Part Number	Outer Impedance and Tolerance (ohms)	Inner Impedance and Tolerance (ohms)	Outer Conductor Diameter ± .001"	Inner Conductor Diameter ±.001"
UT-34-50-50	50.0±3.0	50.0±5.0	.034	.008
UT-78-50-25	25.0±3.0	50.0±3.0	.078	.034
UT-85-50-50	50.0±1.5	50.0±2.5	.085	.020
UT-141-50-50	50.0±3.0	50.0±3.0	.141	.036
UT-250-35-12.5	35.0±2.0	12.5±2.0	.250 (2)	.141 (2)
UT-325-100-25	100.0±2.0	25.0±1.0	.325 (2)	.161 (2)
UT-580-100-100	100.0±4.0	100.0±4.0	.580 (3)	.047

(1) For plated conductor allow additional +.001".
(2) Dimensional tolerance ±.002".
(3) Dimensional tolerance ±.003".
(4) Nominal Dielectric Diameter.
(5) T_t/T_o defined on page 3.

UT-141 I — High Temperature Micro-Coax Cables

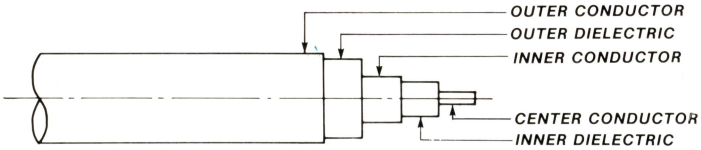
Dielectric Material	Center Conductor Material	Minimum Inside Bend Radius (inches)	T_o (5) (°C)	Typical Attenuation (dB/100') at 25°C				
				0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
MGO	SPCW	.250	400	25.0	37.0	88.0	132.0	198.0
MGO	SPCW	.500	400	13.0	20.0	50.0	78.0	122.0
MGO	SPCW	.750	475	13.0	20.0	50.0	78.0	122.0
MGO	SPCW	1.000	400	8.0	12.0	32.0	52.5	86.0
MGO	SPCW	1.500	900	14.0	20.0	52.0	80.5	125.0

UT-141-50-SS-B — Cryogenic Feed and High Pressure 50 Ohm Cables

Center Conductor Diameter Inside (inches) Nominal	Outer Conductor Material	Dielectric Material	Center Conductor Material	Minimum Inside Bend Radius (inches)	T_t/T_o (5) (°C)	Remarks
Solid	304 SS	FEP	304 SS	.250	175/150	Very Low Thermal Transfer
Solid	BeCu	TFE	SP BeCu	.250	225/200	Solderable, Good Attenuation
.010	BeCu	TFE	SP BeCu	.250	225/200	Solderable, Good Attenuation, Lower Thermal Transfer
.010	304 SS	TFE	SP BeCu	.250	225/200	Good Attenuation, Low Thermal Transfer
Solid	304 SS	TFE	SP BeCu	.500	250/240	
Solid	304 SS	TFE	304 SS	.500	250/240	
.020	304 SS	TFE	SP BeCu	.500	250/240	
Solid	BeCu	TFE	SP BeCu	1.000	250/230	
Solid	304 SS	TFE	SPC	.750	250/230	
.066	304 SS	Spline	304 SS	1.500	250/240	Very Low Loss

UT-85-50-Pb-Nb — Superconductive 50 Ohm Micro-Coax Cables

Center Conductor Diameter Inside (inches) Nominal	Outer Conductor Material	Dielectric Material	Center Conductor Material	Minimum Inside Bend Radius (inches)	T_t (5) (°C)	Remarks
Solid	Pb	TFE	Nb	.250	85	
Solid	Nb	TFE	Nb	.250	150	
Solid	Pb	TFE	Nb	.500	85	
Solid	Nb	TFE	Nb	.500	175	



UT-325-100-25 — Triaxial Cables

Center Conductor Diameter Nominal	Outer Dielectric Diameter ±.001"	Inner Dielectric Diameter ±.001"	Outer Conductor Material	Inner Conductor Material	Center Conductor Material	Outer Dielectric Material	Inner Dielectric Material
.002	.027	.0045	Copper	Copper	Cooper	TFE	TFE
.008	.058	.026	Copper	Copper	SPCW	TFE	TFE
.0045	.065	.015	Copper	Copper	SPCW	TFE	TFE
.008	.1175	.026	Copper	Copper	SPCW	TFE	TFE
.0508	.190 (2)	.117 (2)	Copper	Copper	SPCW	TFE	TFE
.0113	.285 (2)	.118 (2)	Copper	Copper	SPCW	TFE	TFE
.004	.500 (3)	.037 (2)	Copper	Copper	SPCW	TFE	TFE

*: Tin-plated (TP)
•: Silver-plated (SP)
SPC: Silver-plated copper
SPCW: Silver-plated, copper-clad steel.
SP BeCu: Silver-plated beryllium copper.
SS: Type 304 Stainless steel.
SPCT: Silver-plated copper tube.
AL: Aluminum.

SPECIAL PURPOSE MICRO-COAX CABLE

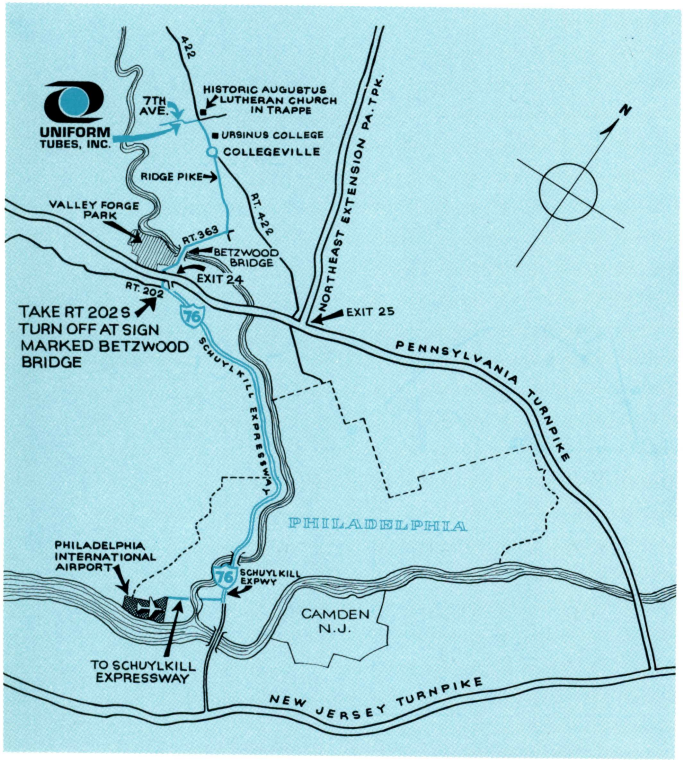
Tables 12, 13 and 14 group special purpose cables by general impedance ranges. It illustrates a small selection of the combinations of the highly specialized, critically controlled cables, conductors, and dielectrics available on special order.

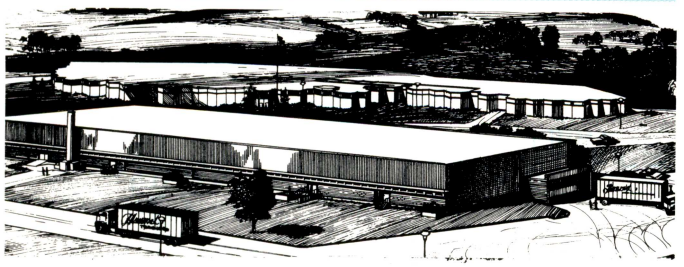
Cable options:

Choice of conductors
Choice of dielectrics
Choice of metallurgical properties

Typical applications:

Medical electronics
Computer
Aerospace
Detectors
Test equipment





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Representatives throughout the United States and other nations.

TABLE 12 — SPECIAL PURPOSE — LOW IMPEDANCE

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ±.001"	Outer Conductor Material	Dielectric Diameter ±.001"
UT-34-10	10.0±4.0	.034	Copper	.025
UT-34-17	17.0±4.0	.034	Copper	.024
UT-44-5	5.0±1.0	.044	Copper	.036
UT-47-35	35.0±1.5	.047	Copper	.037
UT-70-25	25.0±2.0	.070	Copper	.056
UT-75-10	10.0±3.0	.075	Copper	.057
UT-85-15	15.0±2.0	.0865	Copper	.066
UT-90-35	35.0±2.0	.090	Copper	.074
UT-141-10	10.0±1.5	.141	Copper	.118
UT-141-25	25.0±1.0	.141	Copper	.116
UT-141-35	35.0±2.0	.141	Copper	.117
UT-300-25	25.0±2.0	.300(2)	Copper	.261(2)
UT-325-12.5	12.5±2.0	.325(2)	Copper	.285(2)

TABLE 13 — SPECIAL PURPOSE MICRO-COAX — 50 Ohms

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ±.001"	Outer Conductor Material	Dielectric Diameter ±.001"
UT-85-50-AL	50.0±2.0	.0865	1100 AL	.066
UT-85-50-L	50.0±1.5	.0865	Copper	.066
UT-100-50-B	53.0±2.0	.100	Copper	.070
UT-141-50-AL-C	50.0±1.5	.141	1100 AL	.1175
UT-141-50-SS-C	50.0±1.0	.141	304 SS	.1175
UT-141-50-AL-AL	50.0±1.5	.141	1100 AL	.1175
UT-141-50-AL-AL-52	50.0±1.0	.141	5052 AL	.1175

TABLE 14 — SPECIAL PURPOSE — HIGH IMPEDANCE

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter ±.001"	Outer Conductor Material	Dielectric Diameter ±.001"
UT-48-75	75.0±3.0	.048	Copper	.037
UT-85-70-B	70.0±2.0	.084	Copper	.056
UT-90-70	70.0±2.0	.090	Copper	.074
UT-90-100	100.0±2.0	.090(2)	Copper	.075(2)
UT-130-93-AL	93.0±1.5	.130	1100 AL	.1055
UT-130-93-SS	93.0±1.5	.130	304 SS	.1055
UT-141-100	100.0±2.0	.141	Copper	.1175
UT-250-110	110.0±2.0	.250(2)	Copper	.210(2)

(1) For plated conductor allow additional +.001".
(2) Dimensional tolerance ±.002".
(3) Dimensional tolerance ±.003".
(4) Nominal Dielectric Diameter.
(5) T_t/T_o defined on page 3.

UT-34-10

Dielectric Material	Center Conductor Diameter (inches) Nominal	Center Conductor Material	Capacitance (Pf./Ft.)	Minimum Inside Bend Radius (inches)	Typical Attenuation (dB/100') at 25°C				
					0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
TFE	.0201	SPC	145.0	.125	88.5	124.0	280.0	400.0	566.0
TFE	.0159	SPC	85.0	.125	58.5	83.0	188.0	270.0	392.0
TFE	.032	SPC	290.0	.250	117.5	166.0	374.0	531.0	755.0
TFE	.016	SPC	41.0	.125	25.0	25.0	36.0	119.0	173.0
TFE	.032	SPC	57.0	.125	19.0	33.0	64.0	93.0	136.0
TFE	.0453	SPC	145.0	.250	39.0	55.0	126.0	181.0	259.0
TFE	.046	SPC	97.0	.250	24.5	34.5	79.5	115.0	167.0
TFE	.032	SPC	41.0	.250	13.5	19.0	45.0	66.0	98.0
TFE	.092	SPC	145.0	.250	19.0	27.5	63.5	92.0	135.0
TFE	.064	SPC	57.0	.250	10.0	19.0	33.5	50.0	105.0
TFE	.0508	SPC	41.0	.250	8.0	12.0	29.0	43.0	65.5
TFE	.144	SPC	57.0	.500	4.5	7.0	17.0	26.5	42.5
TFE	.213	SPCT	121.0	.750	7.0	10.0	24.0	36.5	56.0

UT-141-50-AL-C

Dielectric Material	Center Conductor Diameter (inches) Nominal	Center Conductor Material	Minimum Inside Bend Radius (inches)	Typical Attenuation (dB/100') at 25°C				
				0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
TFE	.0201	SPCW	.125	13.0	19.0	44.0	64.5	96.0
TFE	.0201	Tophet C†	.125	72.0	102.0	230.0	328.0	470.0
TFE	.0201	SP BeCu	.250	11.0	16.0	38.0	55.0	82.5
TFE	.0359	SPC	.250	8.0	11.5	28.0	41.5	64.0
TFE	.0359	SPC	.250	11.0	16.0	38.0	56.0	83.5
TFE	.0359	1100 AL	.250	9.5	14.0	33.0	49.0	74.0
TFE	.0359	1100 AL	.250	10.0	14.5	35.0	52.0	78.0

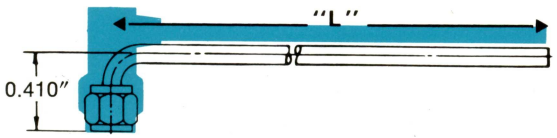
† Trademark W.B. Driver Co.

UT-250-110

Dielectric Material	Center Conductor Diameter (inches) Nominal	Center Conductor Material	Minimum Inside Bend Radius (inches)	Typical Attenuation (dB/100') at 25°C				
				0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
TFE	.0063	SPCW	.125	23.0	33.0	76.0	110.0	160.0
TFE	.0113	SP BeCu	.125	16.0	23.0	51.0	74.5	110.0
TFE	.0142	SPCW	.125	12.5	18.0	42.5	62.5	93.0
TFE	.0069	SPCW	.125	16.0	23.0	54.0	78.5	115.5
TFE	.0113	SPCW	.250	11.0	16.0	38.0	55.0	82.5
TFE	.0113	SPCW	.250	15.5	22.0	55.0	75.0	110.0
TFE	.0108	SPCW	.250	10.0	14.0	33.5	50.0	75.5
TFE	.0159	SPCW	.250	8.5	12.5	30.0	45.0	68.0

*: Tin-plated (TP)
•: Silver-plated (SP)
SPC: Silver-plated copper.
SPCW: Silver-plated, copper-clad steel.
SP BeCu: Silver-plated beryllium copper.
SS: Type 304 Stainless steel.
SPCT: Silver-plated copper tube.
AL: Aluminum.

RIGHT-ANGLE MICRO-COAX CABLE ASSEMBLY (UT-85-049)



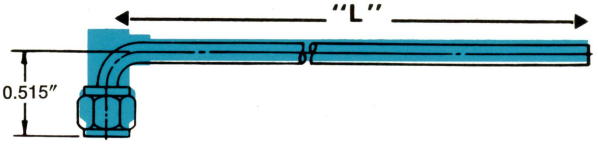
Note the space saving in comparison with a conventional SMA connector shown in blue silhouette.

TABLE 15

Uniform Tubes Assembly Number Plus	Cable Finish	"L" (inches)
–001	–	2
–002	TP	2
–003	–	4
–004	TP	4
–005	–	6
–006	TP	6
–007	–	8
–008	TP	8
–009	–	10
–010	TP	10
–011	–	12
–012	TP	12
–013	–	14
–014	TP	14
–015	–	16
–016	TP	16
–017	–	18
–018	TP	18
–019	–	20
–020	TP	20
–021	–	22
–022	TP	22
–023	–	24
–024	TP	24
–025	–	30
–026	TP	30
–027	–	36
–028	TP	36
–029	–	48
–030	TP	48

TP: Tin-plated Cable

RIGHT-ANGLE MICRO-COAX CABLE ASSEMBLY (UT-141-049)



Note the space saving in comparison with a conventional SMA connector shown in blue silhouette.

TABLE 16

Uniform Tubes Assembly Number Plus	Cable Finish	"L" (inches)
–001	–	2
–002	TP	2
–003	–	4
–004	TP	4
–005	–	6
–006	TP	6
–007	–	8
–008	TP	8
–009	–	10
–010	TP	10
–011	–	12
–012	TP	12
–013	–	14
–014	TP	14
–015	–	16
–016	TP	16
–017	–	18
–018	TP	18
–019	–	20
–020	TP	20
–021	–	22
–022	TP	22
–023	–	24
–024	TP	24
–025	–	30
–026	TP	30
–027	–	36
–028	TP	36
–029	–	48
–030	TP	48

TP: Tin-plated Cable

OTHER MICRO-COAX PRODUCTS & LITERATURE AVAILABLE

- Micro-Coax® Design Guide on Semi-Rigid Coaxial Cable and Cable Assemblies, and Coaxial and Waveguide Delay Lines. Bulletin 712A.
- Micro-Coax® Low Profile Right-Angle Coaxial Cable Assemblies. Bulletin 270A.
- Micro-Coax® Z_O Transformer Cable and Cable Assemblies. Bulletin 772A.
- Micro-Coax® Low-Pass Filter Cable and Cable Assemblies. Bulletin 774A.
- Micro-Coax® "In-A-Cable" Band Pass Filter. Bulletin 776.
- Micro-Coax® Determining Changes in Phase Occurring with Changes in Temperature. Technical Bulletin 580.

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